AU/AWC/RWP036/96-04

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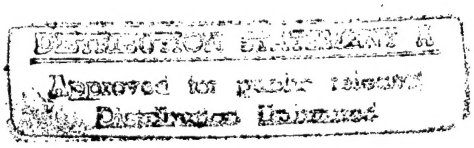
IT STILL TAKES AN AGENT. . . .

AFOSI TECHNO-TOOLS FOR 2025

by

Robert W. Broeking
Lt Col, USAF



A Research Report Submitted To the Faculty

In Fulfillment Of the Curriculum Requirement

Advisor: Dr. Joan Johnson-Freese

Maxwell Air Force Base, Alabama

1 April 1996

24 OCTOBER 1997

POC: AIR WAR COLLEGE.
ADVANCED AIRPOWER STUDIES
MAXWELL AFB, AL 36112

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Abstract

Future technologies will change the way law enforcement and investigations are conducted by AFOSI. By the year 2025, the three main revelations in this area could be the computer, the use of space-based assets for remote sensing, and the development of non-lethal weapons for use by AFOSI Special Agents. This paper explores the use of science and technology through the use of a fictional essay, a discussion of the new technologies, some associated problems, and an outlook as to how AFOSI will apply the technologies.

Chapter 1

Introduction

In 1995, the Chief of Staff of the United States Air Force directed Air University to undertake a study, *Air Force 2025,* of what the future held for the United States Air Force in the year 2025. Much as an earlier study entitled, *SPACECAST 2020, Air Force 2025* is about the future with a no holds barred attitude toward concept development. Although the author did not participate in this study, the concept was used and applied to the Air Force Office of Special Investigations (AFOSI). The AFOSI is a separate operating agency with the Air Force and aligned under the Inspector General. AFOSI conducts felony level investigations in the criminal, fraud, and counterintelligence arenas in support of the Air Force. This paper is a study of how AFOSI will fight crime and conduct investigations in the year 2025. In this fictional essay part of this paper, *The Investigation*, new technologies are highlighted that can and will be obtainable in the future. How AFOSI uses the technologies is the main thrust in this first section. Throughout the essay it is important to understand that the agents would not be successful in solving a crime unless they knew how to manage the vast amounts of information that is available to them in the year 2025. Having information is one thing; knowing how to manage it a critical factor. The distillations of the topics within the essay relate to three separate technology groupings for later discussions. First, use of computers for data

storage, analysis, communication, connectivity and the tie to the Information Superhighway. Secondly, space based assets is a topic for analysis with a discussion of non-lethal weapons completing the trilogy. New science and technology are not without problems and crime-fighting tools are no different. The last section examines some of the pertinent issues surrounding the new technologies presented in the paper. The author is confident that AFOSI will overcome these problems and become the organization for the United States Air Force in 2025 . . . a total team player in support of the men and women of the United States Air Force.

Chapter 2

The Investigation

Special Agent John Thompson of the Air Force Office of Special Investigations (AFOSI) rolled over in his bed as the videophone beeped. He gave the verbal command to automatically answer the phone in the one way view mode, and the face of Sgt. Vance Williams, the on-duty McChord Air Force Base Security Police Desk Sergeant, came on the screen.

"Sorry to wake you Agent Thompson but we have a body downtown and it's reportedly an Air Force member."

"What do we have?" asked a groggy but awakening Thompson.

"The Tacoma Police Department (PD) discovered a guy in a car down by the waterfront. The car had a base decal so they scanned the license plate and it came back to an Airman Chuck Johnston assigned to our base," reeled off Williams.

"Do you have any video from the scene?" Thompson asked, now alert and starting to get dressed.

Williams connected a video clip taken by the Tacoma patrol officer first to arrive on the scene onto the videophone screen. Thompson was able to clearly view a person slumped over the wheel of the car. Thompson asked for a zoom of the shot and saw that the man had sandy brown hair cut in the style of a military member. Thompson asked

Williams to initiate a remote hook up with the patrol officer. The patrol officer appeared on the screen and Thompson made a mental note to grab his raincoat on the way out as he saw water droplets on the lens. As early as the late 20th century patrol cars had been becoming outfitted with cameras that took continuous video of actions taken by patrol personnel. The video had helped to alleviate many instances of abuse against the police. Each patrol officer also wore a mini-camera.[1] Thompson advised that AFOSI would respond and they could process the scene together. The patrol officer acknowledged the instructions and gave Agent Thompson the coordinates to the exact area where the crime scene was located among the confusing alleys and dead ends around the waterfront. Thompson grabbed his *Personal Investigative Computer Assistant* (PICA)[2] from his desk and finished dressing.

The PICA had been issued to him by HQ AFOSI in Washington DC just one month ago and had quickly transformed the way business was conducted. Billed as the complete investigator's tool, the PICA is a powerful personal computer with built in communications ability. It is smaller than the notebook size computers of the late 1990s and has a digital video screen next to an embedded microphone. A keyboard is accessible from the back, but it is rarely used; most preferring to rely on voice activated commands. What makes it unique is the scanner ports on the front that could be used to scan anything from documents to fingerprints. Before leaving the house, he checked that the coordinates the patrol officer had given him were in the PICA. Once in the government car he hooked the PICA into the on-board microprocessor installed in the car; transferring the coordinates into the built in Global positioning System (GPS) navigation system. As he pulled away from his garage, a map appeared on the "heads up" display along with

line-by-line instructions about how to get there. Considered a novelty in the late 20th century, this system had been perfected and made durable a few years back. Once other agents arrived at the detachment workshop, they would be able to track his whereabouts on an electronic map, again benefiting from the GPS receiver. Although the AFOSI had an office on base none of the agents had permanent desks there as they all preferred to work out of their home. This was possible due to the communication advances in the last ten years making a "virtual office" the norm. Sometimes even staff meetings were via video teleconferencing. The "office" was mainly the place where interviews were conducted and the personnel met to discuss group issues.

The PICA's voice-recognition capability was stunning[3] so he simply requested that the name Chuck Johnston along with the other personal identifying data be checked against the database of the Defense Index of Criminal Investigations. This database maintained in Washington DC would tell him if there were any past "hits" on this probable victim. His PICA beeped as he was pulling into the street adjacent to the scene telling him the check was complete. Thompson looked down and saw a prior narcotic case file number in the record. Thompson commanded, "retrieve case file" and the PICA busy light glowed red. As he was parking the car, it beeped again, and Thompson saw the text of the report written some five years ago appear on the screen. The PICA could have dictated the report to him but instead he saved it for later reading. The information flow had been getting so fast over the past few years it was important to sift through information quickly without over loading and clouding intuition. Some agents were finding this a difficult process to master in this fast-paced era.

Exiting the car, Thompson grabbed a satchel containing the AFOSI Portable Analysis Lab (PAL)[4] and walked over to where his friend, Detective Kelly, was standing.

"I was waiting for you to arrive before we process the scene; thanks for coming. . . ." Detective Kelly began.

"No sweat, let's get started and see what we have" replied Agent Thompson silently smiling to himself. Since AFOSI reaped many of the benefits of research and assets that the Department of Defense owned or operated, local law enforcement agencies were shifting more and more of their workload to DOD investigative agencies if any connection to the DOD could be established. In the late 20th century, during budget cutting exercises, AFOSI had been combined with the Navy and Army, but the consolidation did not last as each service wanted their own organic investigative capability. Once again separate, AFOSI was a part of the trilogy of military investigative agencies that served the military community first, but were also servants to handle many civilian matters. These requests to assist civilian communities were coming more often and the approvals to support them were equally frequent.

Approaching the car, Agent Thompson read the license plate and base decal into his PICA and within seconds a return arrived correctly identifying the car as belonging to a Chuck Johnston. Earlier, the patrol officer who found the car had scanned the victim for signs of life through the open driver's side window, detected none, and had left the scene undisturbed. The patrol officer used the recently deployed Lifescan, a simple device that gave a readout on a tiny screen of the vital signs of a person. First used by paramedics, the Lifescan had since been issued to most police officers as the fastest method to

assessing accident scenes and relaying the proper information back to hospitals on the status of victims. Putting on surgical gloves, the two investigators approached the car.

"Let's scan the outside before we do anything else," Agent Thompson directed. He pulled the PAL from his satchel and scanned the outside of the car finding many fingerprints that looked as if they were clear enough to identify. Placing the small scanner against each print, the pattern was read into the PAL, then transferred to the PICA for a label with the date, time and who had "lifted" the prints. This worked well with the PAL evidence collection device and saved enormous amounts of time. Some had argued that fingerprints were a technique of the past, but DNA identification techniques were just now becoming unobtrusive[5]. Opening the door, the two saw a pool of what appeared to be blood next to the body on the seat. Now, moving the body away from the steering controls it was obvious that the victim had been shot in the right side of the head at close range. It was amazing that guns were still being used as lethal weapons in the hands of criminals when most law enforcement officers were now carrying non-lethal weapons. Since the late 20th century, efforts by government and private concerns had worked hard to ban lethal weapons such as handguns. Largely these efforts were unsuccessful, as the personal weapon lobby remained strong. Ironically, now the police carried non-lethal weapons while most criminals continued to ply their trade with guns and other lethal weapons. Using the PAL again, Agent Thompson placed the probe into the car and activated the sensor. Within moments it registered a faint trace of cocaine in the vehicle. And to think they used to have dogs sniff for narcotics! The reading was transferred into the PICA and logged. With Detective Kelly's assistance the two took various samples of fibers and hairs from within the vehicle while placing an electronic tag

(label) for each one simply by dictating into the PICA. The evidence collection log was also created independently in another file for each piece of evidence that was gathered. When the scene was complete, the two with the help of paramedics removed the body and retrieved the wallet from his pants pocket.

"Doesn't look like robbery . . . he has $50 still on his electronic debit card" observed Kelly. Agent Thompson grunted a reply as he scanned the military Identification (ID) Card through the card reader on his PICA. The data came back as Airman Chuck Johnston. The victim certainly looked like the photograph on the ID card, but to be sure Agent Thompson placed the thumb of the victim on the scanning port of the PICA and read the print into memory. He then asked for a comparison of the print data from the ID card. Within 20 seconds, a slight beep notified them that the victim was indeed Chuck Johnston. Other than the sniffer response for cocaine, the investigators could not find any narcotics in the car.

As the paramedics loaded the body into the transport, the investigators stood in the drizzle pondering what they knew. They had one body, positively identified as Chuck Johnston, killed by an apparent gunshot wound to the head. How he came to be in his car on a deserted side of town was the million-dollar question. It was unknown what he was doing there, how long he had been there, and most importantly, who killed him. Playing back the GPS map-reader in the car would tell them a lot. This memory data had been a part of the system that the Attorney General with the support of law enforcement agencies had pushed through the Congress and the President. Much like the clipper chip debate in the 1990s, this issue was key to solving many crimes. Like the clipper chip that allowed law enforcement agencies to wiretap cellular phones with a legal court order, the GPS

historical data allowed law enforcement agencies to review exactly where the car had been for quite some time. The memory was one gigabyte in the GPS system so quite a bit of data could be retrieved. By comparison, advances in memory technology allowed his PICA to contain a ten-gigabyte storage capacity, an amount unheard of twenty years ago. Miniaturization of components over the years had opened up the possibilities for more complex systems and data storage devices. Agent Thompson downloaded the data into the PICA for later review.

"Let's head to the office," suggested Agent Thompson.

Upon arriving at the AFOSI office at McChord AFB, the two sat down in the conference room and plugged the PICA into the networked computer system at the office. They used a larger overhead screen to display what they had collected to date. They first looked at what DCII had on the victim. As the report scrolled down it was obvious that Airman Johnston was heavily involved in the narcotics use and distribution at his last base in Virginia, but the AFOSI there had not been able to obtain prosecutable evidence against him. There were three separate source reports that had Johnston selling drugs to other airman, but when picked up and questioned, he had denied the charges. Without more substantial information, Johnston was not charged. Thompson asked for a video clip from the case file from the taped SUBJECT interview. After watching a few minutes, it was obvious that Johnston had something to hide while being questioned. A voice stress analysis was shown above the videotape highlighting areas where Johnston displayed deception during the questioning. There were a lot of names of associates and friends of the victim in the report and Agent Thompson requested a comparison of all names in the report with the McChord AFB roster of assigned personnel. While that

request was being processed, they poured themselves a cup of coffee and briefed the other two agents who had responded to the office as a back up team. Prior to reviewing the data in the GPS system taken from the car, Agent Thompson dictated an affidavit for the base legal officer to review prior to asking for permission to read (search) the data from the Wing Commander. Once it was complete, he asked the PICA to connect to the home number of the legal officer.

"Hello, this is Col James."

"Col James, this is John over at AFOSI. I have some evidence on the death case the security police briefed you on and I need a search authority from the Wing Commander to review. May I forward you the affidavit and ask you forward it to the Commander?" Agent Thompson suggested. The colonel agreed and Agent Thompson hit the send button forwarding the affidavit data file to the Colonel at his residence. He could see Col James reading what had appeared on his screen then saw him shake his head.

"That's fine John, I will forward it and he should be calling you shortly" responded Col James.

As they began their second cup of coffee the PICA beeped with the results of the cross match of the associates of the victim and the McChord roster. One named matched and belonged to a Sgt. Warren Smith. His named was run through DCII by the PICA, but the only hit was the reference to the Johnston case already found. The PICA beeped and Agent Thompson picked it up to see a message that the wing commander was on the line. Thompson acknowledged and the image of the wing commander appeared on the screen.

"I read the affidavit and it looks good to me. I feel you have probable cause to review the GPS map data. Your search authority is granted. Go ahead and enter your ID code now" directed the Wing Commander.

Agent Thompson pushed the ENTER key on the PICA and transmitted his personal authentication code to the Base Commander whose terminal acknowledged and authenticated the transmission.

"OK, it looks good here. Keep me briefed on what you find," the Colonel said.

Agent Thompson and Detective Kelly now had permission to review the data file and they prepared to display it on the overhead screen. As the file began scrolling, it merely showed the course of the vehicle for the last 50-60 hours depending on the memory of the device. As the dot representing Johnston's car traveled down a map, the coordinates and time were displayed on the right. They backed it up 12 hours from the last movement and then had to fast forward through the data as it sat in a parking lot on the Air Force base. Agent Thompson made a mental note to locate the parking lot specifically, but he thought it was near a hanger where the victim would have been working. As the counter read to within 4 hours of the last entry, the car showed movement off base and two stops of about 30 minutes each enroute to the crime scene. After the last stop the vehicle had made a direct beeline for the spot where it was found almost indicating that the victim knew where he was going and had simply punched in an address or coordinates and followed the on screen instructions. Unfortunately this data was not stored in the historical file. The car had arrived at the site approximately 2 hours before it was found by the patrol officer.

Remembering that Detective Kelly had seized the electronic debit card as evidence, Agent Thompson again prepared an affidavit for legal and command review seeking a search authority to gain access to the records. After hearing back from the Wing Commander who granted the request, Agent Thompson swiped the debit card through the card reader in the PICA and waited for the data. This card reader port was the most important input device on the PICA since so many records were now read by card readers around the world versus paper inputs. A few minutes later a ledger appeared on the screen indicating that originally it was a debit card worth $75 and then there had been three purchases on the card since it was activated. Two transactions were six and two days earlier respectively, and were for electric charges for his vehicle as two different service stations. A third charge was at a "Stop and Go" store for $11.22 approximately 12 hours earlier. Both investigators dictated a note to theirs "to do" lists to contact the store and interview any witnesses.

"Well, let's sum up what we have so far, then go home get a shower and fresh start," suggested Agent Thompson. The other agents gathered around the table for the skull session.

"We have a deceased, one Airman Chuck Johnston, who appears to have been killed by a gunshot wound to the right temple, but no weapon was found at the scene. We know that at one time there was a presence of cocaine in the car due to the trace amount we discovered with the sniffer. We have one match of a previous associate from a narcotics case who is stationed here in the area. The hot leads are the GPS map data from his car and the debit card records."

Detective Kelly suggested they ascertain what the stops were prior to parking at the waterfront and to follow up on his associate, Sgt. Warren Smith. Agent Thompson agreed and dispatched two agents to locate the stops from the GPS data. Before they left, he gave them share access to all his files on his PICA. They could now access all of the information on their own PICAs. After the others had left, Agent Thompson decided to request support from The Law Enforcement Satellite Network (LEAN) through an e-mail to HQ AFOSI. Over 10 years ago, the DOD had launched a satellite in coordination with DOJ that allowed one half-meter resolution to be used for law-enforcement purposes with a proper search warrant. It had been found that the bad guys had access to satellite technology through the private sector, and had the edge in certain areas where the police were lacking. The cooperation between DOD/DOJ had been successful in launching a constellation of "smallsats" that had radar, image, IR, and "sniffer" sensors on board. With a search warrant, federal law enforcement agencies could use LEANSAT to assist in their cases. Approval authority rested with a federal judge or in the case of AFOSI, with the General Counsel of the Air Force.

The two agents dispatched by Thompson now called in and relayed that the first site was a convenience store and that they had shown the clerks the victim's electronic image from the ID card data stored in the PICA and the clerk had remembered the victim. The clerk related that the victim had been accompanied by one other man and provided a description. The clerks provided a dictated statement that Agent Thompson and Detective Kelly reviewed on his PICA. These statements, along with all of the other data already acquired would be part of the final report that would be assembled along with the help of an artificial intelligence software program.[6] The agents were off to the next

coordinates and soon reported back that it was a house in central Tacoma. Running the address through their PICA, they searched the city/county records and determined the owner was currently living in Portland, Oregon and listed the residence with the county as a rental. Running the license plate of a car in the carport through the State Department of Motor Vehicles determined it was registered to Warren Smith, a past known narcotics associate of the victim. The agents downloaded the digital license picture of Smith into their PICA and headed back to the convenience store. Once there the clerk again identified Smith as the man accompanying the victim to the store. It was starting to come together; the victim was last seen at a convenience store where some snacks were purchased using his electronic debit card in Smith's presence. Smith looked to be a likely suspect and Agent Thompson followed up on his e-mail requesting LEAN support on a surveillance of Smith's residence in central Tacoma.

While this request was being processed over the next 12 hours, Agent Thompson and Detective Kelly conducted witness interviews in the victim's squadron and waited for the autopsy results. Heading home after more than 16 hours working the case, they looked forward to a good night's rest before beginning the surveillance of Smith the following morning.

The next morning Agent Thompson checked his PICA and saw the e-mail he was looking for . . . he had LEAN support with an authorization code encrypted into the e-mail. He phoned the LEAN National Center in Colorado Springs, CO; passed his authorization code via encrypted e-mail, and requested LEAN coverage of Smith's residence as well as tracking coverage on the GPS transceiver that agents were about to install on Smith's vehicle. In the request, Agent Thompson first asked for sniffer

coverage. Through a technology originally requested by the Drug Enforcement Agency, LEAN could test for trace amounts of illegal narcotics at given coordinates. He then asked for a visual surveillance support of the residence and surrounding area.

The medical examiner assistant called at that moment and confirmed the cause and manner of death. The cause of death was a single 9mm slug to the right temple at a range of 2-3 feet and the manner of death was ruled as a homicide based upon information provided by the investigators. Checking the request to search the FBI fingerprint database in West Virginia, Agent Thompson was not surprised to learn the print lifted from the outside of the car came back to Smith. They had their suspect...they just needed something to bring it all together. What led up to the shooting?

"Let's hope we get something out of this," lamented Detective Kelly.

"I think there is a good chance that Smith will lead us to a motive; let's be patient and we can wrap this up," responded Agent Thompson.

They went to the conference room to await the LEAN results. The first pass detected no narcotics in the area surrounding the residence. The agents glanced at each other . . . the second pass would not be for two hours. Early that afternoon the results from the second pass were recorded; cocaine was detected in or about the residence. The imagery revealed Smith arriving back at his house and heading to the far reaches of the back yard that backed up to a large field that sloped toward Puget Sound. IR sensors indicated the individual was carrying a metal object that was hotter than the surroundings, but when he returned to his house, he did not have the object. The law enforcement trained LEAN operators knew what to do. On the next pass, they focused on the field with their IR

sensor and found the metal object. This information was passed to Agent Thompson and Detective Kelly.

"Two guesses what is out in that field behind his house?" Agent Thompson asked while widely grinning.

The facts provided by LEAN were filed in an affidavit and a search warrant was issued for the field and residence of Smith while an arrest warrant was also issued.

"This guy may be dangerous, let's take the foam gun," suggested an agent to Thompson.

"OK, but use it as a last result, the foam is just too messy. . . ." Thompson answered grinning broadly.

The force departed the office and drove to the site where they broke into tactical groups to serve the warrant and place Smith into custody. Agent Thompson used a ruse with a neighbor to get Smith to exit his residence and identified himself as an agent as Smith rounded his automobile. Smith drew an old .38 handgun from his pants, but before he could point it Detective Kelly phased him with his new acoustic beam weapon; effectively dropping the suspect where he stood.[7] The agents converged and he was disarmed. It took about 10 minutes for Smith to regain his sense of balance and coherent thought, but by that time he had been "cuffed" with an electronic bracelet binding the two hands together. Developed for violent criminals who, even when handcuffed, posed a threat, the bracelet had a sensor that monitored the vitals of the prisoner and had the ability to send a debilitating electrical charge if the SUBJECT resists. All of this data was recorded for playback and this restraint device had cut back on many allegations of police abuse when SUBJECTS were being arrested.

While Smith was being transported to the AFOSI office, Detective Kelly led a small party to the back field and in short time found a mound of fresh dirt. Digging down, a 9mm semi-automatic pistol was discovered.

"Think this will match the bullet taken from the victim?" asked Kelly. Meanwhile, another group led by Agent Thompson was searching the house and quickly found a false vent behind a recliner that contained a sizable stash of white powder. Using the PAL to find the stash had been easy and a small sample was tested on the spot and determine to be cocaine with the same chemical "fingerprint" as was found in the victim's car. Armed with this evidence, the investigators retreated to their office back at the base to interview the suspect.

Setting up their tactics for the interview was not difficult—they had a fingerprint found at the scene belonging to Smith, they had the probable murder weapon, and they had witnesses that place Smith with the victim prior to his death. Still, the investigators wanted to be sure that they nailed the case shut. When confronted with the overwhelming evidence, Smith admitted to killing the victim after an argument as to how to spilt the spoils from a drug deal. When shown down linked videos of him walking to the back lot, he admitted to burying the gun earlier that day. The suspect provided a full dictated statement into the PICA. Soon the security police arrived and the suspect was removed to a confinement facility to await an arraignment. Agent Thompson and Detective Kelly sat in the conference room sipping a cola, completely drained by the intense two days.

"Well . . . tomorrow I'll organize a draft report using my PICA and e-mail it to you for a review." said Agent Thompson.

"Sounds good, let's set up a computer simulation of the crime scene and the murder as Smith said it happened to prepare for the arraignment" Kelly offered.

"OK, that will wrap it up" said Agent Thompson as he pressed the "sleep" button on his PICA. Time to get some sleep of his own now, Thompson headed home.

Notes

[1] The camera is like a mini cam that allows a feed of video and audio to be tracked back at the police headquarters or recorded for later retrieval. The cam was unobtrusive and worn around the head with a simple lightweight headband.

[2] Pronounced "PIKA."

[3] The technology had been improved to the point that voice recognition was a reliable and accurate method of conducting most all entries into a computer controlled device.

[4] The PAL had been a stand-alone analysis tool issued about 2 years earlier, but now the PICA had been engineered to receive all of the data from PAL. This enabled evidence collection efforts to be quicker and more accurate.

[5] The scientists had perfected the rapid DNA test using data from a hair or fluid from the body, but were still working on picking up "DNA traces" that people leave behind when touching objects. Fingerprints were still a very reliable method of identification that could be quickly done with the computing power available in 2025.

[6] Like many "AI" programs in use, the software kept a history of Agent Thompson's writing style and the basic format of an AFOSI Investigative Report. The software, after information was entered, made formatting and placement choices, thereby creating a report as each investigative step was recorded.

[7] The acoustical beam weapon emitted a low frequency sound wave that could be sharply focused on a suspect. The sound against an eardrum caused the individual to lose all motor skills and simply collapse. The device is described in Chapter VI.

Chapter 3

AFOSI and 2025

This story is set in the year 2025 and highlights technologies that are being developed now. It is highly probable that many of the situations described in this essay will become possible crime fighting scenarios. AFOSI has always been a technology leader within the law enforcement and investigations arena. In fact, AFOSI often is ahead of municipal, state and federal agencies when is comes to the use of technology and science. AFOSI was one of the first investigative agencies to create and integrate a computer crime capability into their mission. AFOSI was also an early leader into networking their field offices on a closed encrypted system using over the counter STU IIIs as computer modems. This system, although suffering through growing pains, is far and beyond what most agencies have to include the Federal Bureau of Investigations (FBI). Most agents have access to notebook computers and dedicated cellular phones for their official use.

AFOSI's heavy use of computers has resulted in a computer on the desk of every field agent. If this trend continues there should be no doubt that AFOSI will continue to be on the forefront of science and technology as it relates to investigations. There are three main reasons that AFOSI is able to be a leader in this area. First, are resources; simply put, we get our fair share from the Air Force budget and DOD counterintelligence funds that are available. AFOSI resource advisors at HQ AFOSI and SAF/IGX have

learned how to sell the mission of AFOSI to resource allocation specialists in the Pentagon. Likewise, AFOSI's reorganization in 1991 along MAJCOM lines has allowed our senior field commanders to get closer to our customer, the MAJCOM/CC and CINCS. By doing this, AFOSI has been better able to scope and mold our mission to the needs of the customer. In turn, the customer has been in a better position and strength to rally behind our resource requests on the Air Staff. In real dollars, although the budget of AFOSI is large, it is a small amount on the overall Air Force spreadsheet.

Closely related to resources is the second reason AFOSI is a technology leader...its place in the Department of Defense. The DOD traditionally has been leader is the development and application of new technologies and products. AFOSI benefits to some degree by being closely related to this because we need the ability to investigate these complex matters. Hence, AFOSI must keep pace with technology advances and often time the organization rides on the coattails of other organizations within DOD. Is there a better armor being developed for another DOD mission? Then perhaps we can use the technology to create a better body armor or armor for the vehicles used in out Protective Service Mission. Are hackers using new technology to "phreak"[1] phones through a computer? AFOSI must counter this with more advanced software programs and associations with other Air Force units. Now we work closely with and actually have agents assigned to the Air Force Information Warfare Center in San Antonio, Texas. AFOSI also sees the tremendous potential of space based assets in conducting investigations, hence one of the duties of the senior agent assigned to Air Force and United Space Command in Colorado Springs is to develop those ideas and applications.

The third reason AFOSI has remained a leader in technology is the leadership of the organization. This career field nurtures risk takers and innovators and by the time an officer reaches the senior ranks of AFOSI they understand the type of risks to undertake in order to ensure AFOSI's competitiveness. This ability to see potential rather than dead ends, to see success rather than failure, places the AFOSI as an organization in a positive light. Clearly, AFOSI will remain a leader in the law enforcement and investigations arena in the use of science and technology to complete the mission to the best of its abilities. Now it is important to examine some of the key technologies illustrated in the fictional essay to determine their applicability, probability of development, and any problems associated with their use.

For organizational purposes, the technologies are grouped in three major areas for consideration and analysis; computer applications, space-based assets, and non-lethal weapons. Computer applications are highlighted in *The Road Ahead* by Bill Gates of Microsoft. The concept for the PICA was developed from the interactive CD-ROM that accompanied the book and contained video short stories about the future.[2]

Notes

[1] Phreaking is a term developed within the hacker community to denote tampering with and gaining control of phone instruments, phone lines, and networks for use in an overall computer hacking incident.

[2] Bill Gates, *The Road Ahead,* (New York; Viking Penguin Books, 1995) CD-ROM.

Chapter 4

Computer Technology

One of the most important applications of computer technology that investigative agencies can exploit is the ability of the modern computer to collect, analyze, store and disseminate information. Access to information in the form of criminal databases is the lifeblood of an investigator. Computerized fingerprint data collection and analysis are available today in its infant stages. Electronic Data System Corporation (EDS) currently has a $9.6 million dollar contract with Los Angeles County to develop and maintain a desktop fingerprint identification system. The project is based upon Hewlett Packard (HP) Company and Cogent System's Incorporated hardware for scanning and storing the fingerprint data.[1] The FBI is currently developing a similar system on a national scale but the size and scope of their data holdings will be a major obstacle to that initiative. This is why large municipalities and some states are starting this process on their own. The Sunnyvale California Police Department currently uses the technology that HP and Cogent developed and it saves them an enormous amount of time. What used to take an hour to fingerprint and book now takes five minutes, and a search by a skilled technician can locate a positive match on a suspect can take as little as 15 minutes if the fingerprints are contained in the database.[2] These locales are developing their own fingerprint databases on the simple assumption that the FBI national system is in the out years and

that the large majority of crime in an area is caused by criminals who live in the local area and have more than likely already entered into the system.[3] The use of the PICA to enter the data (the deceased's fingerprint) and have the connectivity to a national database for identification will be a reality.

Connectivity to other databases is also the key to an investigator's success. It is extremely helpful to know if a suspect has a prior record of criminal activity.[4] Paperless offices and networked personnel are in wide use today. AFOSI currently houses vast quantity of paper reports of investigations that are required by law to be maintained for a prescribed length of time. AFOSI is currently working to reduce this voluminous material to electronic data for storage and retrieval. Other agencies are also doing this with increasing regularity.[5] The ability to access and retrieve data is the key to reducing investigative time and overhead. A system called COPS—Criminal Offender Profiling System—is in use by the California Serious Habitual Offender program within the Department of Justice.[6] An automated case file is the result; there is never a case misfiled or temporarily unavailable due to the filing process.[7] AFOSI has started along this course evaluating software programs for large investigations to track and sort data and now with the newer versions of CACTIS - Criminal and Counterintelligence Tracking Information System. CACTIS brings all of the initial data needed to open an investigation into a database for retrieval and analysis. Integrating the complete report writing process into this electronic form is the next logical step.[8]

The use of databases with technical reference material is becoming more and more important to the investigator. Using PC data connectivity, the investigator will be able to access these databases from the field when he or she needs the information. Communica-

tion via encrypted PC data links versus radio or cellular links largely eliminates the threat to the communications system by exploitation.[9] Further discussion of this will be covered in the threat and difficulties section of this paper.

To manage this enormous amount of information, the investigator will access artificial intelligence software that will be developed to assist the investigators. All of the available data concerning a case will be entered into the PICA and a program will analyze the information, providing possible leads or the narrowing of the pool of suspects. Although nothing can replace a seasoned investigator's "sixth sense" and gut feelings, this software will make it much easy to organize and make sense of information.

Examples of this future technology are already in use by law enforcement agencies nationwide. The Chicago Police department uses a custom-made analysis software package called STAC (Spatial and Temporal Analysis of Crime). This software helps officers identify "hot spots of gang activity and crime" through the analysis of raw data containing over 200 variables.[10] STAC has been designed to run on a variety of platforms to include DOS, Windows, and UNIX. Another system, PACE (Police Automated Computer Entry System), developed by Unisys Corporation for the Phoenix Police Department is already in operation and has many of the same properties as STAC.[11] The San Bernardino Sheriff's Office uses desktop mapping software package to locate high crime areas in a graphic representation, then uses the data to plot counteroffensives against the criminals.[12] The computer assisted mini cam used by the patrol officer in this essay to show the crime scene to a remote viewer is also going through testing at the present for military applications.[13] Law enforcement applications are right around the corner. Another area of science and technology that is just beginning

to see use within the investigations arena is the space-based remote sensing. This next section highlights the possibilities and realities of this new form of information from space.

Notes

[1] Jim Walsh, "Database aids identification process," Computerworld, 25, (April 15, 1991): 39.

[2] Stephanie Thompson, "Dick Tracy Lives," *American City and County*, 107, (May 1992): 48.

[3] Ibid.

[4] Did DECEASED have a prior record of criminal activity?—in this case yes and this narcotics connection helped to resolve the investigation.

[5] Using the PICA, OSI agents will be able to not only retrieve that there was a case on DECEASED, but the contents of the case while in the field for analysis ands inclusion in their current case by cutting and pasting the electronic documents.

[6] Thompson, "Dick Tracy Lives."

[7] "Technology in Law Enforcement," *American City and County,* v106, (May 1991): 38.

[8] Using the PICA to do this in 2025 just takes advantage of the increased connectivity available with personal computers/communication devices.

[9] Edmund J. Pankau, "The Consummate Investigator." *Security Management,* V37, (Feb 1993): 37.

[10] Mark Moore, "Plotting a Strategy to Curtail Crime," *PC Week,* V10, (Dec 27, 1994): 35.

[11] Thomas Hoffman, "Taking a Byte out of Crime: Phoenix Police use CASE, other tools to speed work," *Computerworld,* V27 (August 16, 1993): 81.

[12] Mitch Betts, "Computer Maps Help Cops Catch Crooks—Desktop Mapping," *Computerworld,* V25, (Feb 15, 1993): 32.

[13] Jacqueline M. Graves, "How Cops will rearm Tom Clancy Style," *Fortune,* V130, (Jul 11, 1994): 16.

Chapter 5

Space-Based Assets

Imagery and remote sensing from space-based platforms may be the ultimate technology advance that law enforcement and investigations will experience as we advance toward 2025. The LEAN satellite network used in the essay is not only a possibility, but a probability for the future. 1996 will be a milestone year as private companies, both in the US and abroad, place private satellites in orbit valued at over one billion dollars to supply imagery to customers. LANDSAT and SPOT are already available to consumers. For $4,400 and $2,200, respectively, an image, anyone can get three-meter resolution photographs of anyplace in the world. The satellites scheduled to be launched beginning this year will provide three meter resolution in 1996 and one meter resolution by 1997. Companies involved include Lockheed Martin Corporation, E-Systems Corporation, a unit of Raytheon, and Orbital Sciences Corporation.[1] The world will be transformed overnight as the quality improves and the price declines.

What is important to remember is that this information and data will be available to anyone with the resources to pay for the service. This means particularly large, organized, and dangerous elements of criminal activity will have the data. What better way to survey a location to be attacked or robbed than to sit back and have images sent over the Internet thousands of miles away from the site? If the criminals have this

material it is imperative that law enforcement personnel and investigators also have the "eyes." The Russians', sensing a way to gain hard currency, are currently selling 2-3 meter resolution imagery to any buyer in the marketplace for $1,000-$5,000.[2]

The potential uses for space based imagery as highlighted by the essay exist today. Local and state authorities often call AFOSI offices to determine if there was any satellite coverage over a specific area where a crime has taken place. Unfortunately, what they do not understand is that satellites deployed as national assets are just that—national assets. As such their mission is centered on national defense with only a small margin available for "other" missions. The advent of *commercial* imagery sources has changed this prohibition. There are currently forensic science associated companies right now in the United States using remote sensing data as an investigative tool. David Sugiyama, a former California forensic-laboratory investigator; now runs the private Forensic Science Services of California, Inc. in Los Angeles. In 1994 he used low-resolution satellite technology to help reconstruct a homicide. Although the results were mixed due to the poor quality of the pictures, he is convinced that in the near future the technology will allow investigators to solve crimes through the use of imagery.[3]

With this new technology come new problems. Recently, Psytep Corporation in Kansas sold what it purported to be imagery of a location involved in a criminal enterprise. The Kansas Bureau of Investigation (KBI) requested the imagery in a murder investigation against a Kansas religious cult. The evidence was supposed to show that the suspect's vehicle was not where they reported it was in their statements to police. The imagery was used during the grand jury and was a key piece of evidence that led to the indictment of the suspects. The imagery was later found not to be of the right area and

false. The CEO of the company has been indicted himself on mail and wire fraud charges based upon the assumption he knowingly sold false photographs to the KBI.[4] The image was supposed to have been taken from the Japanese JERS-1 satellite with 18-meter resolution capability. Psytep said they could enhance the imagery to 2-3 meters through software conversion, but it is not currently possible, according to experts in this area.[5] Psytep offered their services to the prosecution team in the O.J. Simpson murder investigation, but were turned down.

Other applications of space based assets such as remote sniffing capability for illegal narcotics is not farfetched and may be available by 2025. Infrared Sensing (IR) as illustrated in the essay is also available today. Using this technology to determine if suspects are armed and to recover evidence will be common place as highlighted by the Newark Police department's use of IR sensing in their stolen vehicle swat unit[6] Currently, GPS technology is such that many examples used in the essay could be implemented today. GPS has varied uses for the investigator from surveillance of suspects to the location of officers conducting investigations, allowing back up teams to quickly respond if assistance is required.[7] Tying GPS systems to computer maps is already available and will be perfected in the next five years making it common technology. The key to all of this spaced-based remote sensing discussion will be the development of an *omnisensorial* capability to include all forms of sensing.[8] This type of sensor similar to the LEANSAT analogy will "collect and fuse data from all sensory inputs—optical, olfactory, gustatory (taste), infrared, multispectral, tactile, acoustical, laser radar, millimeter wave radar, X-Ray, and DNA patterns to identify objects (buildings, people) by comparing their structural sensory signatures (SSS) against a

database."[9] The first two areas, computers and space based remote sensing are tools for the investigator. The next section reveals how the investigators will protect themselves in the future when dealing with dangerous criminals.

Notes

[1] Jeff Cole, "Eyes in the Sky, "W*all Street Journal,"* (Monday, Nov 30, 1995): 1.

[2] James R. Asker, "High Resolution Imagery Seen as a Threat, Opportunity," *Aviation and Space Technology,"* (May 23, 1994): 51.

[3] Cole, "High Resolution Imagery": A10.

[4] Warren Ferster, "Firm Suspected of Misrepresenting Imagery," *Space News,* (Jan 16-22, 1995): 19.

[5] Ibid.

[6] Abe Dane, "Night Hawks," *Popular Mechanics,* V171, (Nov 1994): 79.

[7] David C. Morrison, "Crime Fighting 2001," *Government Executive,* v26, (Oct 1994): 43.

[8] "Leveraging the Infosphere: Surveillance and Reconnaissance in 2020 (SPACECAST 2020)," *Airpower Journal,* Summer 1995, V9, 2, 10.

[9] Ibid.

Chapter 6

Non-Lethal Weapons

Non-lethal weapons are the choice for the future. "Dr. John Alexander of the Los Alamos National Laboratory in New Mexico defines non lethal warfare as the application of technology that allows force to be projected while minimizing the potential for lethal consequences."[1] Again, the military is in the forefront of the research and technology development as scientists search for new methods of immobilizing an enemy without loss of life. Discussions at the Air War College in 1995 tend to lean towards the position that non-lethal weapons are being developed as a result of the smart weapon technology. As precision guided munitions and smart weapons were used in combat in the last ten years, the American people have come to expect fewer casualties in combat. Based upon eroding public support for unrestricted lethal warfare, non-lethal weapons will be the weapons of choice in the future. The natural assimilation by the law enforcement community will follow in short order. In an urban environment where the risk of collateral causalities is high, non-lethal weapons offer the police a safe alternative to firing lethal weapons in highly trafficked areas. The unfortunate conclusion of the siege of the Branch Davidian complex by ATF and the FBI may be avoided in the future by applying a non-lethal weapon rendering the suspects incapable of causing further violence. Following the siege, Attorney General Janet Reno said that the "potential for

payoffs in new technology (for non-lethal weapons) is unlimited."[2] Weapons currently under development in laboratories across the country include foam guns designed to shoot a stream of very sticky foam onto an assailant, thereby immobilizing the person. The weapon is about the size of a large shotgun and is connected to a backpack worn by the shooter. Another weapon is an acoustical sound beam weapon that emits a powerful low frequency sound wave that causes the inner ear to vibrate abnormally. Silent to the human ear, the sound beams can reduce a suspect to a confused, unbalanced daze leading to unconsciousness. High-frequency acoustical weapons have a risk as being an indiscriminate weapon unless properly able to focus on an assailant. [3]Also in prototype development is a chemical laser and a bright light rifle that can flash blind an attacker.[4] All of these future weapons have the potential for great applicability for future law enforcement and investigations where the suspects are dangerous and need to be neutralized for public safety. As noted earlier, there will be a call for the use of non-lethal weapons by government agencies (police) as a result of undesirable results from confrontations such as the Waco situation. Although there may be some type of lethal weapons control enacted, the criminals will have access to old lethal weapons (guns) for perhaps five to ten decades into the future. This will result in law enforcement personnel facing criminals using decisive, but non-lethal weapons while the "bad guys" will have lethal weapons and the notion to use them. This dichotomy is one example where science and technology will not solve all problems for police in their fight against crime. And there are other examples where the application of new technology and science to law enforcement investigations is not without problematic concerns.

Notes

[1] Maj Jonathan W. Klarren and Maj Ronald S. Mitchell, "Nonlethal Technology and Airpower—A Winning Combination for Strategic Paralysis," *Airpower Journal,* Special Edition 1995, V9, SE, 43.

[2] Robert Langreth, "SoftKill—Nonlethal Weapons Technology," *Popular Science,* V245, (Oct 1994): 67.

[3] Maj Joseph W. Cook and Maj David Fiely, and Maj Maura McGowan, "Nonlethal Weapons—Technologies, Legalities, and Potential Policies," *Airpower Journal,* Special Edition 1995, V9, SE, 85-86.

[4] Langreth, "Softkill—Nonlethal Weapons Technology."

Chapter 7

Problematic Concerns with Technology and Science

The major hurdle to clear as technologies advance the ability of criminal investigator to solve crimes, is the privacy issue. Americans have been worried about "big brother" and government intrusion since the founding of civilized governments. The connectivity of computer databases allows investigators to know an increasing amount of information about people. Privacy and law enforcement issues have and will clash in the future. Recently in West Windsor, NJ, a citizen was arrested not because an officer observed him doing anything wrong but because a scan of his license plate into the officer's PC connected to a database showed that the individual had an expired license. The citizen is arguing in the courts that he was arbitrarily stopped—without reasonable suspicion or probable cause, and that the database query amounted to an illegal search and seizure.[1] The use of space based imagery platforms raise other Orwellien concerns as the to what else might be viewed in an image that might violate a person's right to their privacy under the constitution. The fourth amendment considerations are important in this debate as government forces develop greater investigative tools.

Protection and security of investigators' computer databases is paramount if the integrity of the information is to be trusted. Hackers that gain access to this information would be in a dangerous position to exploit it for criminal purposes. Corrupted and

incorrect data may lead to criminals being set free on technicalities and rights of honest citizen's violated. Such was the case in Arizona where a clerk inadvertently forgot to remove an arrest warrant for a man in Phoenix. When the man was picked up, he was found to have marijuana in his car but he could not be prosecuted for the narcotics due to an illegal search and seizure.[2] "Good faith" exceptions to these problems will only go so far in the courts of tomorrow.

The use of non-lethal weapons also requires more research and discussion. What of the use of a non-lethal technology that causes a death? Let me explain . . . placing a tire-trapping device across a highway to stop a fleeing felon is a non-lethal technology. But what if the felon loses control of the automobile and is killed in the ensuing crash. A non-lethal weapon was used that resulted in a death. Was it a right, proper, and legal use of non-lethal technology? And is it still considered non-lethal? These discussions are taking place in the military community where these weapons are being developed and it will also have to take place in the civilian realm before use by police agencies.

As science and technology advances continue to give the investigator more tools to do their job, more challenges in the legal arena will present themselves. It will be incumbent on agencies to allow the right mix of high tech tools while ensuring they are compatible with constitutional rights. Working hand in hand with justice agencies will be the key to success in these areas.

Notes

[1] David W. Chen, "Law Enforcement and Privacy Interests Clash on Technology," *The New York Times,* V145, (Oct 15, 1995): P14n.

[2] Ibid.

Chapter 8

Conclusion

This paper presented a picture of the future for AFOSI in the year 2025. The essay, *The Investigation,* depicts a time when AFOSI Agents will have access to more information than they ever contemplated. Knowing how to manage this information; when to use it and when not to, will be the key to success. For all of the technologies described in this paper are aids, and only the agent can be expected to resolve an investigation. With this newfound power of information comes the responsibility of agents to use it properly and accurately to conduct investigations. No one can determine what awaits the law enforcement and investigative community twenty-five years from now, but all of the technologies described in this paper are attainable and possible. Obviously computers are here to stay and eventually interface with all parts of our daily life. Benefits from space based technologies are just beginning to infiltrate society at a commercial level. This area will probably see the most growth in the next ten to fifteen years. The emphasis on non-lethal weapons cannot be overstated as they will be an integral portion of the formula for successful law enforcement and investigations. I am confident that all of the technologies painted in this essay will in fact be available as tools to assist investigators.

American governmental agencies and the private sector will lead the way just as they have done during the last two centuries. AFOSI is the right organization, at the right time, with the right resources to take the most advantage of this technology revolution. The United States Air Force must remain committed to maintaining the preeminence of their own internal investigative agency so that AFOSI is in the best position to use these technologies to protect and serve the United States Air Force. There will hard choices ahead and it is imperative that senior Air Force and Department of Defense leaders make the decision to support AFOSI in its conduct of investigations and protecting Air Force members and their families. In turn, AFOSI will continue to be an indispensable player on the Air Force team to 2025 and beyond.

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